Environmental Monitoring Solutions

SOLAR RADIATION (Global Irradiance)

Class A Pyranometers



- Spectrally flat Class A pyranometers compliant with ISO 9060:2018
- Sensors ideal for monitoring the performance of solar panels and weather networks
- Several types of outputs (µV, 4...20 mA, RS485)
- Calibration traceable to WRR
- Model with RVH (Recirculating Ventilation and Heating) technology and tilt angle measurement (DPA953.1)

Radiometers for measuring solar radiation in accordance with WMO Standard No. 8 (Part I, Chapter 7). These sensors are classified as Class A ISO 9060:2018. With a total daily uncertainty of less than 2% and fast response times, these pyranometers are ideal for users who require high levels of accuracy and reliability.

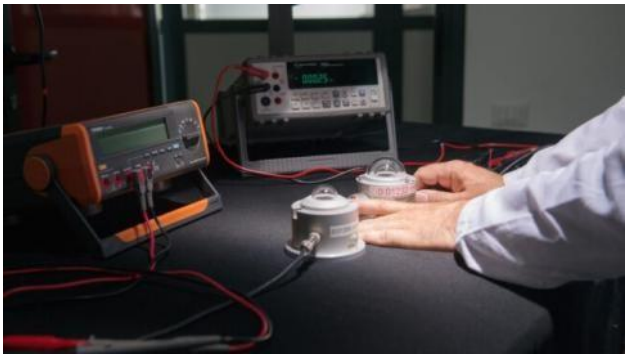
Technical Specifications

PN	DPA252.2	DPA952.3
Output	µV	RS485-Modbus
Output values (progr.)	-	Inst, max/min/ave (1...3600 s)
RS485 protection		Galvanic insul. (3 kV, UL1577)
Power supply	-	10...30 V AC/DC
Max load	-	-
Power consumption	-	0.5 W
EMC	-	EN 61326-1: 2013
Thermopile sensitivity	8...25 µV/W/m^2	-
Measuring range	0...4000 W/m^2	0...2000 W/m^2
Spectral range	285...3000 nm	
Impedance	40 ± 3 Ω	-
Response time (T95)	<5 s	
Zero offset A	<±7 W/m^2	
Zero offset B	<±2 W/m^2	
Total zero offset	<±10 W/m^2	
Instability per year	<±0.8%	
Non-linearity	<±0.5%	
Directional response	<±10 W/m^2	
Spectral error	<±0.5%	
Clear sky global horiz. irradiance spectral error	<±0.5%	
Temperature response	<±1 %	
Tilt response	<±0.5%	
Add. signal proc. errors	±2 W/m^2	
Calibration certificate	Included	
Cable	Not included (see Accessories)	
Data logger compatibility	• Alpha-Log (with ALIEM) • E-Log	• Alpha-Log • E-Log (ELO3305.1)

PN	DPA952.1	DPA952.4	DPA953.1
			
Output	RS485-Modbus	4...20 mA (default) 0…20 mA, 0…1/5/10 V (configurable)	RS485-Modbus
Output data	• Irradiance in W/m² • Sensor's temperature, RH%, pressure	Irradiance in W/m²	• Irradiance in W/m² • Sensor's temperature, RH%, pressure • Tilt angle • Fan speed RPM and current in A • Heater current in A
Output values	Instant value		Running average value over 4 measurements, refreshed every 0.1 s
RS485 protection	Isolated RS485	-	TVS diodes for surge protection
Power supply	7...30 V DC	10...30 V DC (4...20 mA, 0...1/5 V) 15…30 V DC (0...10 V)	8...30 V DC
Max load	-	0/4...20 mA: ≤500 Ω 0...1/5/10 V: ≥100 kΩ	-
Power consumption	37 mA @ 24 V DC; Iout=22 mA 43 mA @ 12 V DC; Iout=22 mA		< 3 W @ 12 V DC
EMC	-	-	EN 61326-1: 2013
Measuring range	-200...4000 W/m²	0...2000 W/m² 0…1/5/10 V: 0...2000 W/m²	-400...4000 W/m²
Spectral range	283...2800 nm		285...3000 nm
Temp, RH, press sensor	YES		
Tilt sensor	-		YES (Acc ± 1°)
Ventilation and heater	-		YES
Response time (T95)	2 s		3 s
Zero offset A	<±7 W/m²		<±2 W/m²
Zero offset B	<±2 W/m²		
Total zero offset	<±10 W/m²		<±5 W/m²
Instability per year	<±0.5%		
Non-linearity	<±0.2 % (100...1000 W/m²)		
Directional response	<±10 W/m²		
Spectral error	<±0.2%		<±0.5%
Temperature response	<0.5% (-10...40 °C)		<0.4% (-30...50 °C)
Tilt response	<±0.2% (0...90° @ 1000 W/m²)		
Cable	Not included (see Accessories)		
Data logger compatibility	Alpha-Log	Alpha-Log, E-Log	• Alpha-Log • E-Log (ELO3305.1)

Common Technical Specifications

Class A Pyranometers	ISO 9060:2018 classification	Spectrally flat Class A (Secondary Standard)
	WMO performance level	High quality pyranometer
	WMO estimate on achievable accuracy for daily sums	±2%
	Standard built-in bubble level	YES, including adjusting leveling screws (on mounting arm)
	Data provided with each sensor	• Calibration certificate • Temperature dependence data • Directional response data
	Calibration traceability	WRR
	Recommended recalibration	Every 2 years
General information	Housing	Anodized aluminum
	Mounting (pole Ø 45...65 mm)	See Accessories according to the model
	Weight	0.5 kg
	Protection rate	IP66
	Anti-radiation shield	Included
	Operative temperature	-40...80 °C



LSI LASTEM is an ISO17025 accredited laboratory for irradiance measurements. All sensors produced are tested in our laboratories. LSI LASTEM produces test reports for each sensor supplied and, upon request, ISO17025 and ISO9001 calibration certificates (see Accessories list).

Class B Pyranometers



- Spectrally flat Class B (First Class) pyranometer. Compliance with ISO 9060:2018
- Electrical insulated (DPA855-980), Galvanic insulated (DPA980)
- Calibration traceability to WRR
- Modbus register for Instant value, Ave/Min/Max values over programmable time base (DPA980)
- 10...30 V AC/DC power supply (DPA855/980)
- Ideal instrument in PV plants performance monitoring and meteorological networks

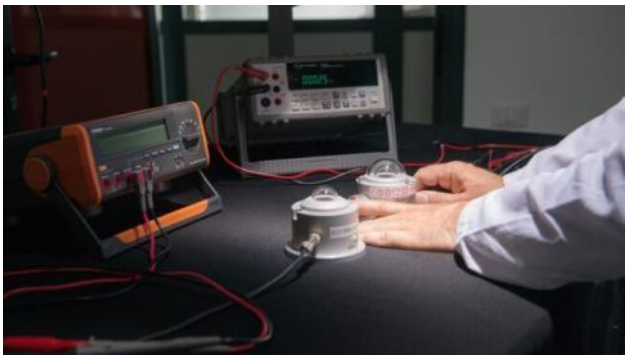
Radiometer for solar irradiance measurement, according to ISO 9060 and WMO No. 8 (Part I, Chapter 7) standards. These sensors are classified as ISO9060 Class B. With a total daily uncertainty of 5% within 0...180° field of view, flat spectral response (285-3000 nm) and optimal temperature stability, these pyranometers represent the optimal compromise between cost and quality of irradiance measurement.

Technical Specifications

PN	DPA154	DPA855	DPA980
Output	µV	4...20 mA	RS485-Modbus
Output values (progr.)	-	-	Inst, max/min/ave (1...3600 s)
RS485 protection	-	-	Galvanic insulation (3 kV, UL1577)
Power supply	-	10...30 V AC/DC	10...30 V AC/DC
Max load	-	300 Ω	-
Power consumption	-	0.5 W	0.5 W
EMC	-	EN 61326-1: 2013	EN 61326-1: 2013
Thermopile sensitivity	8...25 µV/W/m^2	-	-
Measuring range	0...4000 W/m^2	0...1500 W/m^2	0...2000 W/m^2
Impedance	40 ± 3 Ω	-	-
Calibration certificate	Not included (see Accessories)		
Cable	Not included (see Accessories)		
Data logger compatibility	• Alpha-Log (with ALIEM) • E-Log	• Alpha-Log (with ALIEM) • E-Log	• Alpha-Log • E-Log (ELO335.1)

Common Technical Specifications

Class B pyranometer	ISO 9060:2018 classification	Spectrally flat Class B (First Class)
	WMO performance level	Good quality pyranometer
	WMO estimate on achievable accuracy for daily sums	±5%
	Spectral range	285...3000 nm
	Response time (T95)	<15 s
	Zero offset A (response to 200 W/m^2 net thermal radiation)	<±15 W/ m^2
	Zero offset B (response to 5K/h change in ambient temperature)	<±3 W/m^2
	Total zero offset	<±21 W/m^2
	Non-stability	<±1% change per year
	Non-linearity	<±0.5% (100...1000 W/m^2)
	Directional response (0...180°C field of view)	<±20 W/m^2
	Clear sky global horizontal irradiance spectral error	< ±0.5 %
	Temperature response	<±1.5% (-15...35 °C)
	Tilt response	<±1.5%
	Additional signal processing errors	<±5 W/m^2
	Built-in bubble level	YES
	Calibration traceability	WRR
	Recommended recalibration	Every 2 years
General Information	Housing	Anodized aluminum
	Mounting (pole Ø 45...65 mm)	See Accessories according to the model
	Protection rate	IP66
	Anti-radiation shield	Included
	Operative temperature	-40...80 °C



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SOLAR RADIATION (Global Irradiance)

Class C Pyranometers



- Spectrally flat Class C pyranometer. Compliance with ISO 9060:2018
- Electrical insulated (DPA863-873), galvanic insulated (DPA983)
- Calibration traceability to WRR
- Modbus register for Instant value, Ave/Min/Max values over programmable time base (DPA983)
- Ideal instrument in PV plants performance monitoring and meteorological networks

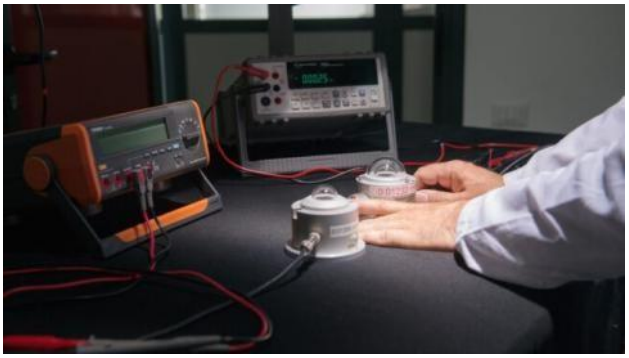
Radiometer for solar irradiance measurement, Class C according to ISO 9060 and WMO No. 8 standards. These sensors are a good compromise for basic meteorological, agrometeorological and solar energy applications.

Technical Specifications

PN	DPA053A	DPA863	DPA983
			
Output	µV	4...20 mA	RS485-Modbus
Output values (progr.)	-	-	Ist, max/min/ave. (1...3600 s)
RS485 protection	-	-	Galvanic insulation (3 kV, UL1577)
Power supply	-	10...30 V AC/DC	10...30 V AC/DC
Power consumption	-	0.5 W	0.5 W
EMC	-	EN 61326-1: 2013	EN 61326-1: 2013
Thermopile sensitivity	8...25 µV/W/m^2	NA	NA
Measuring range	0...2000 W/m^2	0...1500 W/m^2	0...2000 W/m^2
Impedance	40 ± 3 Ω	-	-
Calibration certificate	Included	Not included (see Accessories)	Not included (see Accessories)
Cable	L= 5 m included	Not included (see Accessories)	Not included (see Accessories)
Built-in bubble level	NO (YES, using DYA048 plate)	YES	YES
Mounting	See Accessories according to the model		
Data logger compatibility	• Alpha-Log (with ALIEM) • E-Log	• Alpha-Log (with ALIEM) • E-Log	• Alpha-Log • E-Log (using RS485->232 converter)

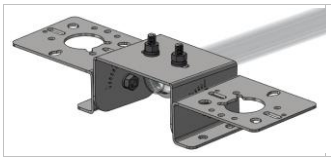
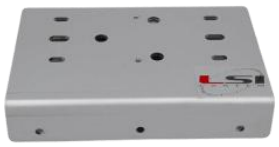
Common Technical Specifications

Class C pyranometer	ISO 9060:2018 classification	Class C (Second Class)
	WMO performance level	Moderate Quality
	WMO estimate on achievable accuracy for daily sums	±10%
	Spectral range	285...3000 nm
	Irradiance range	0...2000 W/m^2
	Response time	<30 s
	Zero offset A (response to 200 W/m^2 net thermal radiation)	<±20 W/ m^2
	Zero offset B (response to 5K/h change in ambient temperature)	<±5 W/m^2
	Total zero offset	<±30 W/m^2
	Non-stability	<±1 W/m^2
	Non-linearity	<± 1% (100...1000 W/m^2)
	Directional response (0...180°C field of view)	<±30 W/m^2
	Clear sky global horizontal irradiance spectral error	< ±1%
	Temperature response	<±1% (-10...40 °C)
	Tilt response	<±1%
	Additional signal processing errors	<±2 W/m^2
	Calibration traceability	WRR
	Recommended recalibration	Every 2 years
General Information	Housing	Anodized aluminum
	Protection rate	IP66
	Anti-radiation shield	Included
	Operative temperature	-40...80 °C



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Accessories

	**TYA250**	Tilting sliding support for fixing 2 pyranometrs to tubolar rod TYA050
	**DYA034**	Horizontal arm for fixing DPA252.2-952.3-953.1-154-855-980-863-983 pyranometers to DYA049 collar Length 440 m
	DYA134	Horizontal arm for fixing DPA952.1 pyranometer to DYA049 collar Length 440 m
	**DYA034.1**	Horizontal arm for fixing DPA252.2-952.3953.1-154-855-980-863-983 pyranometers to DYA049 collar Length 650 mm
	DYA134.1	Horizontal arm for fixing DPA952.1 pyranometer to DYA049 collar Length 650 mm
	**TYA200**	Tilting sliding support for fixing DPA252.2-952.3-953.1-154-855-980-863-983 to tubolar rod TYA050
	**TYA050**	Tubular rod Ø22 sp. 15/10 L 500 mm
	**DYA135**	Tilting arm for fixing DPA952.1 pyranometer to DYA049 collar
	**DYA060**	Lateral fixing arm for pyranometer installation on PV module. Suitable for DPA252.2-952.3-953.1-154-855-980-863-983-053A models
	DYA060	Lateral fixing arm for pyranometer installation on PV module. Suitable for DPA952.1 model
	**DPA245**	Occultation shadow band for diffuse radiation
	DYA150	Kit plate and screws for DPA252.2-952.3-953.1-154-855-980-863-983-053A pyranometer installation on DPA245 occultation shadow band
	DYA152	Kit plate and screws for DPA952.1 pyranometer installation on DPA245 occultation shadow band
	**DEA420.1** **DEA420.2**	Signal amplifier for pyranometers. Output: 4...20 mA Programmable pyranometer sensitivity (μV/Wm^2) Power supply 10...30 V AC/DC For more technical information, see MW9008 catalogue
	MDMMA1010.1	Same features as DEA420.1 but: Output: RS-485 Modbus-RTU

	SVICA4001	Calibration certificate. Under the sun. ISO9001 (Global radiation)
	SVICA4701	Calibration certificate. Under the lamp. ISO9001 (Global radiation)
	SVACA4001	Calibration certificate ISO7025 (Solar irradiance)
	DYA049	Collar for fixing DYA034-034.1 arms to Ø 45...65 mm pole
	**DWA205B**	Cable for DPA952.1-952.4 L=5 m
	DWA210B	Cable for DPA952.1-952.4 L=10 m
	DWA225B	Cable for DPA952.1-952.4 L=25 m
	DWA205.1	Cable for DPA953.1 L=5 m
	DWA210.1	Cable for DPA953.1 L=10 m
	DWA220.1	Cable for DPA953.1 L=20 m
	DWA605A	Cable for DPA154 and DPA252.2. L=5 m
	DWA610A	Cable for DPA154 and DPA252.2. L=10 m
	DWA625A	Cable for DPA154 and DPA252.2. L=25 m
	DWA626A	Cable for DPA154 and DPA252.2. L=50 m
	DWA405A	Cable for DPA952.3-855-980-863-983. L=5 m
	DWA410A	Cable for DPA952.3-855-980-863-983. L=10 m
	DWA425A	Cable for DPA952.3-855-980-863-983. L=25 m
	DWA426A	Cable for DPA952.3-855-980-863-983. L=50 m
	DWA427A	Cable for DPA952.3-855-980-863-983. L=100 m
	CCCOA5002	Female 5 poles connector for DPA952.1 sensor cable
	**DYA048**	Plate for levelling DPA053A on DYA034 or TYA200 arm. Including bubble level
	**DYA120**	Spare anti-radiant shield for DPA053A
	MC1177.R	Spare anti-radiant shield for DPA252.2-952.3-154-855-980-863 -983
	DPA294	Hygroscopic salts cartridge for radiometers DPA252.2-952.3-154-855-980-053A-863-983

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